

## Observations on egg laying by *Epidares nolimetangere* (de Haan) and *Dares ulula* (Westwood)

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### Key words

Phasmida, *Epidares nolimetangere*, *Dares validispinus*, *Dares ulula*, Egg laying, Hairs.

In January 1990 Phil Bragg sent me approximately 40 eggs of *E. nolimetangere*, PSG 99. These eggs are oval, 4mm x 2.5mm diameter, dark brown and are covered with long fine brown hairs that appear to have the property of velcro in that they tend to stick together (I often find 7 or 8 stuck together in this way, I also find many apparently laid singly at random).

Phil kindly wrote a covering note on the conditions they enjoy; if kept warm and moist they appear to thrive. This proved to be the case and in about a year I had 10 adult females and 5 males; the surplus I had given away to other PSG members. I keep the insects in a large plastic propagator (500mm x 350mm x 25mm) with approximately 60mm of medium sized vermiculite on the floor. I feed them on Bramble, Rose, Oak and various other shrubs (to give them variety). This diet seems to suit them and I have very few losses.

On the 5th May 1991 at 9am, I looked into the propagator and noticed that the foliage appeared fresh but dry so I sprayed it with warm tap water. The effects on the females was very interesting, almost all started to dig into the vermiculite. This act in itself was worth observing. The rear and middle legs were splayed and the forelegs pulled the granules from in front and under the head, making a mound under her body. In about 10 minutes each female had made a depression about 15mm deep and the vermiculite was piled up under her body. I realized that I was about to witness egg laying and expected the females to move forward over the holes to deposit an egg or two, then move off leaving the eggs to hatch.

What happened next took me completely by surprise. The female I was watching bent forward at an angle of about 30° with her head down the hole and her ovipositor over her back. Suddenly there was a flick and an egg appeared to hit the female on the back, roll over her head and into the hole. She then immediately started to pull more vermiculite into the hole apparently to cover up the egg. She spent 15-20 minutes filling the hole with the same action as before, then walked away to get a drink from the wet foliage, leaving the pile of vermiculite that was under her body in a heap indicating the egg directly in front of it.

I was trying to watch about six females at the same time and I kept missing the vital second (The act of egg laying is extremely fast, like *Extatosoma tiaratum*).

These observations raised some immediate questions:

1. Has anyone else seen behaviour like this?
2. Do other *Dares* species use this method of egg laying?
3. Are the spines present on the females back used as a guide for the egg?
4. Are these the only phasmid to bury their eggs with their forelegs?

I decided to try to observe other *Dares* spp. but as they are extremely inactive in light, pretending to be dead most of the time, I was aware that it might be some time before I got any results.

On May 11th I made further observations of *E. nolimetangere* and clarified some points.

1. The insect may use any of its six legs to collect material beneath it, but mostly the

- forelegs are used.
2. Before the egg is laid there is much flexing of the ovipositor and a few practice flicks, in slow motion so there is no prospect of releasing the egg too soon.
  3. In most cases the egg passes over the abdomen, thorax and head of the female and lands upon her antennae where it sticks by means of its fine hairs. So the spines do not normally act as guides for the eggs.
  4. The female immediately removes it with her forelegs and starts to bury the egg. This is a very haphazard-process. The insect appears to work by feel and not by sight; perhaps the size of the vermiculite confuses them, it is roughly the same size as the egg.

I have examined the eggs of *E. nolimetangere* under a microscope and found that the hairs on them are strongly hooked at the ends and quite stiff, looking like crochet hooks. It is important that the egg is no more than a few days old when studied through a microscope as the hairs tend to become brittle and the hooks snap off. When 60 or 70% of the hooks have been damaged in this way the egg loses its ability to grip. This doesn't matter once the egg has been deposited as the hooks have done their job and to all intents and purposes are redundant. I have looked at the antennae of *E. nolimetangere* under the microscope and found that they are densely covered with short, stout, curved hairs, exactly suited to catch the egg.

I have looked at the antennae and eggs of the three related species which are in culture, *Dares validispinus*, *Dares ulula*, and *Dares* sp. (PSG 69), and compared them to *E. nolimetangere* (see table 1). Having looked at the ovipositors of these species I did not believe they have the flexibility to lay eggs in the same way as *E. nolimetangere*. Despite many hours of observation I did not observe the act of egg laying in any of these three species until April 1992.

SPECIES	ANTENNAE HAIRS	EGG HAIRS
<i>Dares</i> sp. PSG 69.	Less hairy. Hairs are straight.	Less hairy. Hairs straight.
<i>Dares ulula</i> (Westwood) PSG 117.	Hairs long. Hairs straight.	Almost hairless.
<i>Dares validispinus</i> Stål PSG 38.	Less dense. Curved.	Almost hairless.

Table 1. Comparison of antennal and egg hairs.

In April 1992 a friend had come to visit and he was holding a female *D. ulula* while I was explaining how slow they are to lay eggs, only producing one every two weeks. I showed him some eggs lying on the vermiculite in the cage and he said the female in his hand had an egg in her ovipositor. I gently put her back into her container. Her front and middle legs were on the vermiculite and her back legs on a bramble stem, her body was at an angle of about 20°. She stayed in this position for about two minutes and when she appeared to be completely relaxed, she started to flex her abdomen in exactly the same way as *E. nolimetangere*. After five or six slow practice flicks, she flicked the egg at great speed over her head. The egg landed about 7cm in front of her and bounced to the edge of the container, a distance of about 15cm. The female made no attempt to look for the egg and appeared to ignore it. She remained in the same position for three or four minutes and then walked under a leaf. I then put the lid on the container and returned

the box to its normal place.

My conclusion is that both *E. nolimetangere* and *D. ulula* lay their eggs by catapulting them over their bodies. *E. nolimetangere* catch the eggs on their antennae by means of the hairs on the egg, the insect then removes the egg with her forelegs and buries them. It has taken me two years to see these two species egg laying, I have not yet seen *D. validispinus* or PSG 69 lay their eggs but I now believe that they flick their eggs over their heads in the same way.